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AIRCO
Division of The BOC Group, Inc.

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MATERIAL SAFETY DATA SHEET

Welding Consumables
and Related Products
Conforms to OSHA 1910.1200

IDENTIFICATION

PRODUCT NAME: Carbon Dioxide CO_2

SYNONYMS: Carbonic anhydride

CAS NUMBER: 124-38-9

CHEMICAL FORMULA: CO_2

CHEMICAL FAMILY: Carbonate

DOT HAZARD CLASS: Nonflammable gas

DOT IDENTIFICATION NUMBER: UN 1013

CHEMTREC: 800-424-9300

HEALTH HAZARD DATA

TIME WEIGHTED AVERAGE EXPOSURE LIMIT:

TWA: 5,000 Molar PPM. Its STEL is proposed to be changed from 15,000 Molar PPM to 30,000 Molar PPM (ACGIH, 1984-85)

SYMPTOMS OF EXPOSURE:

Inhalation: Low concentrations (3-5 molar %) cause increased respiration and headache.

Eight to 15 molar % concentrations cause headache, nausea and vomiting which may lead to unconsciousness if not moved to open air or given oxygen.

Higher concentrations cause rapid circulatory insufficiency leading to coma and death.

TOXICOLOGICAL PROPERTIES:

Carbon dioxide is the most powerful cerebral vasodilator known. Inhaling large concentrations causes rapid circulatory insufficiency leading to coma and death. Chronic, harmful effects are not known from repeated inhalation of low (3-5 molar % concentrations).

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RECOMMENDED FIRST AID TREATMENT:

PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE TO CARBON DIOXIDE. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS

Inhalation: Conscious persons should be assisted to an uncontaminated area and inhale fresh air. Quick removal from the contaminated area is most important. Unconscious persons should be moved to an uncontaminated area, given mouth-to-mouth resuscitation and supplemental oxygen. Further treatment should be symptomatic and supportive. Treat areas exposed to liquid as frostbite.

Hazardous Mixtures of Other Liquids, Solids, or Gases:

Forms carbonic acid in the presence of water.

PHYSICAL DATA

Boiling Point: Sublimation Point = -109.3°F (-78.5°C)

Liquid Density @ Boiling Point: Solid Density = 97.5 lb/ft^3 (1562 kg/m^3)

Vapor Pressure @ 70°F (21.1°C): 856 psia (5900 kPa)

Specific Gravity @ 70°F, 1 atm (Air=1): 1.65

Solubility in Water: Very soluble

Freezing Point: -69.8°F (-56.6°C) @ 75.1 psia (518 kPa)

Appearance and Odor: Colorless, odorless gas

FIRE/EXPLOSION HAZARDS DATA

Flash Point (Method Used): N/A

Auto Ignition Temperature: N/A

LEL: N/A UEL: N/A

Extinguishing Media: Nonflammable, inert gas

Electrical Classification: Nonhazardous

Special Fire Fighting Procedures: N/A.

Unusual Fire and Explosion Hazards: N/A

REACTIVITY DATA

Stability:

Stable

Incompatibility (Materials to Avoid):

None

Hazardous Decomposition Products:

Carbon monoxide

Hazardous Polymerization:

Will not occur

Conditions to Avoid:

SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:

Evacuate all personnel from affected area. Use appropriate protective equipment. If leak is in user's equipment, be certain to purge piping with an inert gas prior to attempting repairs. If leak is in container or container valve, contact CHEMTREC for emergency assistance or your closest Airco location.

Waste Disposal Method:

Do not attempt to dispose of residual or unused quantities. Return in the shipping container properly labeled, with any valve outlet plugs or caps secured and valve protection cap in place to Airco for proper disposal.

SPECIAL PROTECTION INFORMATION

Respiratory Protection: Positive pressure air line with mask or self-contained breathing apparatus should be available for emergency use.

Ventilation: See local exhaust.

Local Exhaust: To prevent accumulation above TWA.

Special:

Mechanical (Gen.):

Other

Protective Gloves: Any material.

Eye Protection: Safety goggles or glasses

Other Protective Equipment: Safety shoes.

SPECIAL PRECAUTIONS

Special Labeling Information:

DOT Shipping Name: Carbon Dioxide
DOT Hazard Class: Nonflammable Gas
DOT Shipping Label: Nonflammable gas I.D. No.: UN 1013

Special Handling Recommendations:

Use only in well-ventilated areas. Valve protection caps must remain in place unless container is secured with valve outlet piped to use point. Do not drag, slide or roll cylinders. Use a suitable hand truck for cylinder movement. Use a pressure reducing regulator when connecting cylinder to lower pressure (1500 psig) piping or systems. Do not heat cylinder by any means to increase the discharge rate of product from the cylinder. Use a check valve or trap in the discharge line to prevent hazardous back flow into the cylinder.

For additional recommendations, consult Compressed Gas Asssociation Pamphlets P-1, G-6, G-6.1, and G-6.2.

Special Storage Recommendations:

Protect cylinders from physical damage. Store in cool, dry, well-ventilated area away from heavily trafficked areas and emergency exits. Do not allow the temperature where cylinders are stored to exceed 130F (54C). Cylinders should be stored upright and firmly secured to prevent falling or being knocked over. Full and empty cylinders should be segregated. Use a "first in-first out" inventory system to prevent full cylinders being stored for excessive periods of time.

For additional recommendations, consult Compressed Gas Association Pamphlets P-1, G-6, G-6.1, and G-6.2

Special Packaging Recommendations:

Dry carbon dioxide can be handled with most common structural materials. Moist carbon dioxide is corrosive by its formation of carbonic acid. For these applications, 316, 309 and 310 stainless steels may be used as well as Hastelloy^{R} A, B &C and Monel^{R}.Ferrous nickel alloys are slightly coroded.

At normal temperatures carbon dioxide is compatible with most plastics and elastomers.

Other Recommendations or Precautions:

Compressed gas cylinders should not be refilled except by qualified producers of compressed gases. Shipments of a compressed gas cylinder, which has not been filled by the owner or with his (written) consent, is a violation of Federal Law (49CFR).